addendum to the hp workstation xw6000 hardware reference guide

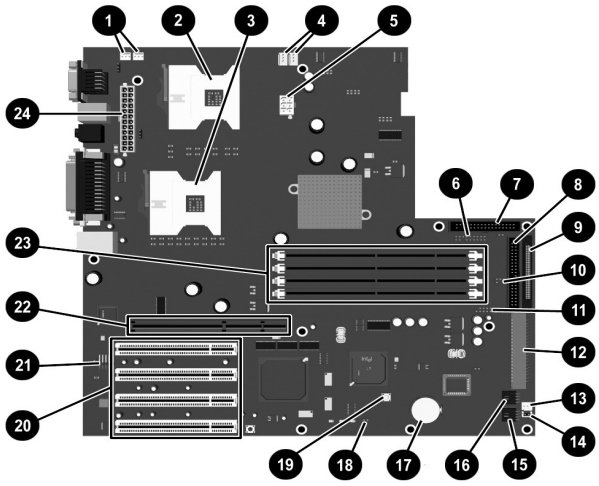
The information in this document, where applicable, supersedes specific contents of the *hp workstation xw6000 hardware reference guide* that is included with your system on the *Documentation Library* CD. This document includes information about:

- System board components
- Installation of a second processor
- Installation of DIMMs
- Hyper-Threading Technology

IMPORTANT: Read this document first before referencing the Hardware Reference Guide included on the *Documentation Library* CD.

System Board Components

IMPORTANT: If the system board part number in your workstation is 339100-xxx, this section replaces the "System Board Components" section of the existing Hardware Reference Guide.



System board connectors

❶ Rear chassis fan connectors	❸ Secondary processor socket
❷ Primary processor socket	❹ Processor fan connectors

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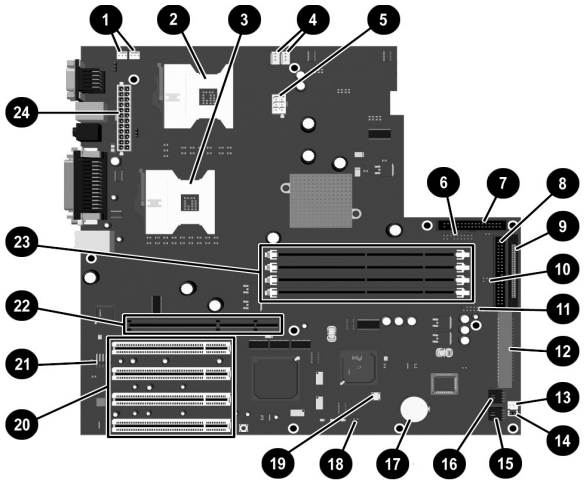


System board connectors (continued)

❺	CPU power connector	⓯	CD-ROM audio connector
❻	Power button/LED connector	⓰	Auxiliary audio connector
❼	Diskette drive connector	⓱	Battery
❽	Primary ATA connector	⓲	Password jumper
❾	SCSI connector	⓳	CMOS reset switch
❿	Hood sensor connector	⓴	PCI sockets
⓫	Front USB connector	㉑	Front audio connector
⓬	Secondary ATA connector	㉒	AGP socket
⓭	Front chassis fan connector	㉓	DIMM sockets
⓮	Internal speaker connector	㉔	24-Position power connector

Installing an Additional Processor

IMPORTANT: If the system board part number in your workstation is 339100-xxx, this section replaces the "Installing an Additional Processor" section of the existing Hardware Reference Guide.

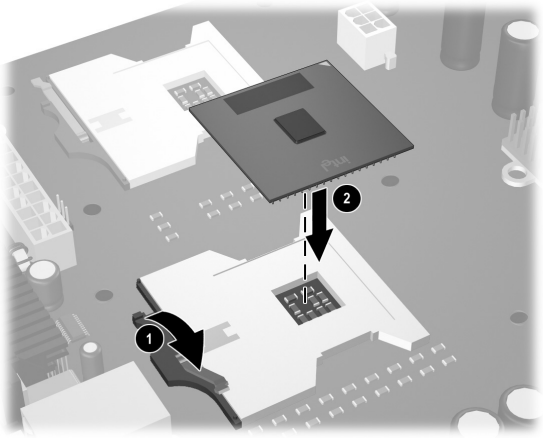
CAUTION: Failure to follow the workstation preparation instructions and these installation steps could result in an improperly installed processor, causing extensive system damage.

NOTE: The second processor must be of the same speed, cache, size, and type as the primary processor.

To install a second processor:

1. Power down your system as instructed in the Hardware Reference Guide.
2. Remove the workstation access panel.
3. Place the workstation in the desktop position.

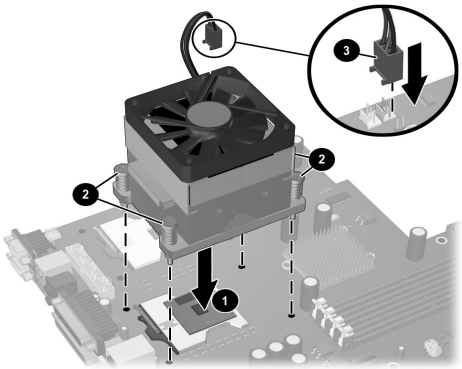
4. Remove any preinstalled screws from the system board around the second processor socket.
5. Open the second processor socket lever ❶ fully (the full swing angle of the lever is approximately 135 degrees).
6. Line up the two keyed corners of the pins on the processor with the two keyed corners of the processor socket and install the processor ❷ into the socket. Ensure that the underside of the processor is level with the top of the processor socket.



7. Lightly press down on the top of the processor while closing the socket lever.
8. Check for proper processor seating in the socket. Using your fingers, carefully try to lift the processor out of the socket. A properly seated processor will not lift out of the socket.
9. Remove and discard the green thermal grease protective liner from the bottom of the new fansink and set the fansink over the processor ❶.

NOTE: Be careful not to touch the exposed thermal grease when handling the fansink.

10. Line up the captive screws ❷ of the fansink with the holes on the system board (the holes where the preinstalled screws were removed earlier).



11. Tighten the screws until they no longer turn and the springs are fully compressed.

NOTE: The screws should be tightened in a crossing pattern to ensure the fansink is secured correctly.

12. Connect the fansink cable to the system board header ❸.

13. Reassemble the workstation and restore power.

NOTE: A manual Hardware Abstraction Layer (HAL) upgrade is necessary when installing a second processor after the system has gone through the software unbundling process. If a second processor is installed prior to unbundling, a manual upgrade is not necessary. HP recommends that the software unbundling process be completed prior to installing additional components. For information about upgrading to a multiprocessor HAL, refer to the documentation included in your processor upgrade kit.

DIMM Installation Guidelines

IMPORTANT: This section replaces both the "DIMM Installation Guidelines" and the "DIMM Installation Configurations" sections of the existing Hardware Reference Guide.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: To reduce the risk of personal injury when replacing or removing DIMMs, allow the module being removed from the DIMM socket sufficient time to cool. DIMM temperatures can reach 212° F (100° C).

CAUTION: When handling a memory module, do not touch any of the contacts. Doing so may damage the module.

CAUTION: Static electricity can damage the electronic components of the workstation or option boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

When adding, upgrading, or replacing PC2100 DDR SDRAM memory modules in the hp workstation xw6000, care must be taken to avoid incorrect pairing of modules in the same channel. This system does not support mixed DIMM pairing on the same channel.

NOTE: See the "System Board Components" section at the beginning of this document (if your system board part number is 339100-xxx) or in the the Hardware Reference Guide for the location of the DIMM sockets.

- For proper system operation, if your system supports DDR-SDRAM DIMMs, the DIMMs must be industry-standard 184-pin, Registered ECC PC 2100 266 MHz-compliant, 2.5 volt DDR-SDRAM DIMMs. The DDR-SDRAM DIMMs must support CAS Latency 2 or 2.5 (CL = 2 or CL = 2.5). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information.
- DIMMs should be installed in pairs.
- Do not mix DIMMs of different memory speeds. Performance will reflect the speed of the slowest DIMM.
- Each DIMM within a pair should be identical in size. For example, a 256MB DIMM must be paired with a similar 256MB DIMM.

- Each DIMM within a pair should be identical in technology. For example, you cannot mix a 256 MB 9-device DIMM with a 128MB 18-device DIMM on the same channel.

NOTE: To identify which DIMM technology you are using, compare the memory size and number of DRAM components on the module. A 128 MB DIMM has 18 DRAM components that fully populate both sides of the module. A 256MB DIMM has 9 DRAM components; four on one side, five on the other.

- The first pair of DIMMS should be installed in slots 1 and 2. The DIMM slots are numbered sequentially. Slot 1 is closest to the CPUs.
- The second pair of DIMMS, if any, should be installed in slots 3 and 4.
- DIMMs must be installed correctly. Be sure to match the keyed slot on the DIMM with the tab on the DIMM socket.
- For optimal system performance, DIMMs should be installed in identical pairs in the following three configurations: slot 1 and 2, slot 3 and 4, or all DIMM slots populated in paired format.
- If you are using a single DIMM configuration, the DIMM should be installed in slot 1 or slot 3.

NOTE: Although a single-DIMM configuration is possible, it does not provide the optimal system performance that a dual-DIMM (dual-channel) of matching sizes, configuration provides.

- If you are installing two DIMMs of different sizes, they can only be installed in slot 1 and slot 3 with each DIMM occupying either slot.

NOTE: Although a mixed size dual-DIMM configuration is possible, it does not provide the optimal system performance that a dual-DIMM (dual-channel) of matching sizes, configuration provides.

- No other memory configurations are supported. Attempts to install memory in other configurations will result in unpredictable system performance.

NOTE: The following table provides acceptable pairing configurations but do not cover all module capacities. However, the same pairing configuration applies regardless of the module type and capacity.

Table 1 - Available Memory Configurations for the xw6000

	Channel A		Channel B	
Module Total	**Slot XMM1**	**Slot XMM3**	**Slot XMM2**	**Slot XMM4**
2	9-device	Empty	9-device	Empty
2	Empty	18-device	Empty	18-device
2	18-device	Empty	18-device	Empty
2	Empty	9-device	Empty	9-device
4	18-device	9-device	18-device	9-device
4	9-device	18-device	9-device	18-device
NOTE: Modules must be paired as indicated in this table where slots 1 and 2, and slots 3 and 4 must contain like modules.				

Hyper-Threading Technology

Hyper-Threading Technology is a high performance technology, developed by Intel®, that allows a single processor to execute multiple threads of instructions simultaneously. Hyper-Threading Technology enables the processor to utilize its execution resources more efficiently, delivering performance increases and improving user productivity. Not all systems benefit from the Hyper-Threading Technology.

To see if Hyper-Threading Technology can benefit you, test your system by turning the feature on using the Computer Setup (F10) system utility. To do this, run F10 Setup during boot up and select Advanced > Device Options > Hyper-Threading, and enable the Hyper-Threading Technology.

Note the following:

- If your workstation does not support Hyper-Threading Technology, the Hyper-Threading menu item will not be available on the Computer Setup menu.
- The Hyper-Threading Technology is recommended for use with Microsoft® Windows® XP systems. This technology is detected by the system and is turned on in the operating system after it is enabled in the system BIOS.
- Hyper-Threading is not recommended for use with Windows 2000-based workstations.
- The Hyper-Threading Technology is compatible with Linux-based systems. An SMP kernel must be installed on your system before this technology can be enabled.
- For more information about the Hyper-Threading Technology, you can visit the Intel Web site at www.intel.com.

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350070-001

hardware reference guide

workstation xw6000

Document Part Number: 301155-001

October 2002

This guide is provided as a reference tool. The topics contained herein describe specific features and will assist you with installing additional components such as hard drives, memory, expansion boards, and processors.

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WARNING: Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

hardware reference guide
workstation xw6000
First Edition (October 2002)
Document Part Number: 301155-001

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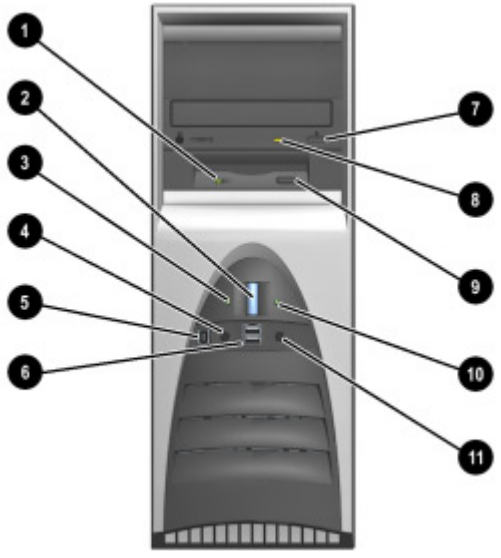
1

Product Features

Standard Configuration Features

The HP workstation xw6000 is a minitower system that can be easily converted to a desktop. Features may vary depending on your model. For a complete listing of the hardware and software installed in your workstation, run Diagnostics for Windows or the INSPECT utility (available on some models). Instructions for using these utilities are provided in the *Troubleshooting Guide* on the *Documentation Library* CD.

Front Panel Components

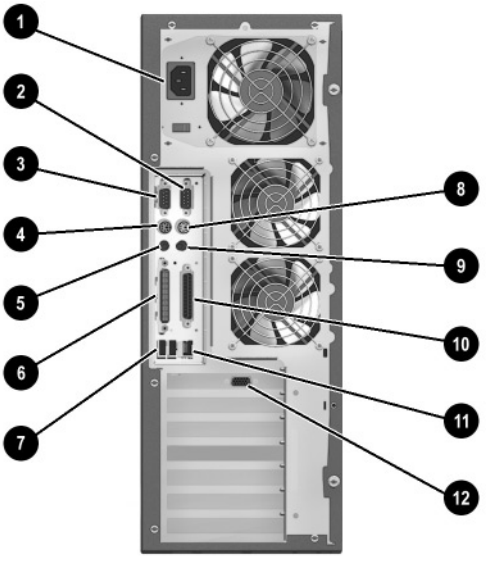


Front panel components

❶ Diskette drive activity light	❼ CD-ROM eject button
❷ Dual-state power button	❽ CD-ROM drive busy indicator
❸ Power-on light	❾ Diskette drive eject button
❹ Headphone connector	❿ Hard drive activity light
❺ 1394 connector (optional)*	⓫ Microphone connector
❻ Universal Serial Bus (USB) connectors	

*Your workstation is equipped with a 1394 connector. This connector is functional only when an optional 1394 PCI expansion board is installed.

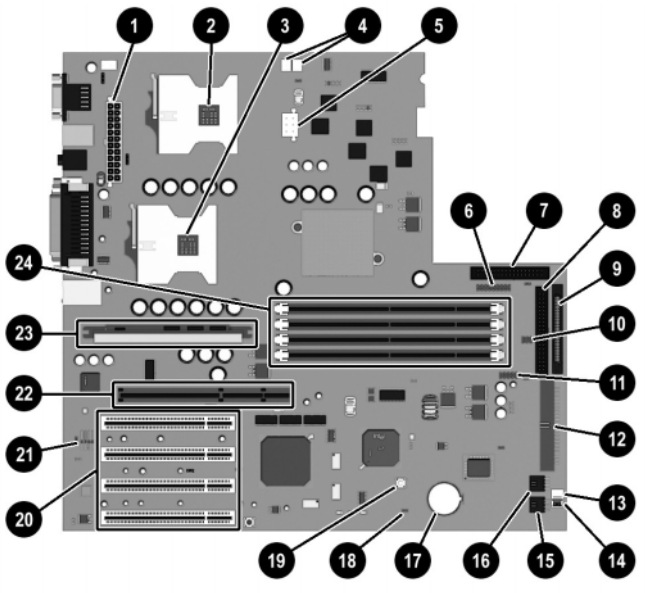
Rear Panel Components



Rear panel components

❶ Power cord connector	❼ Universal Serial Bus (USB) connectors
❷ Serial connector (Serial A)	❽ Mouse connector
❸ Serial connector (Serial B)	❾ Microphone/Line-in connector
❹ Keyboard connector	❿ Parallel connector
❺ Headphone/Line-out connector	⓫ Network Interface Card (NIC) connector
❻ SCSI connector	⓬ VGA (AGP) video connector

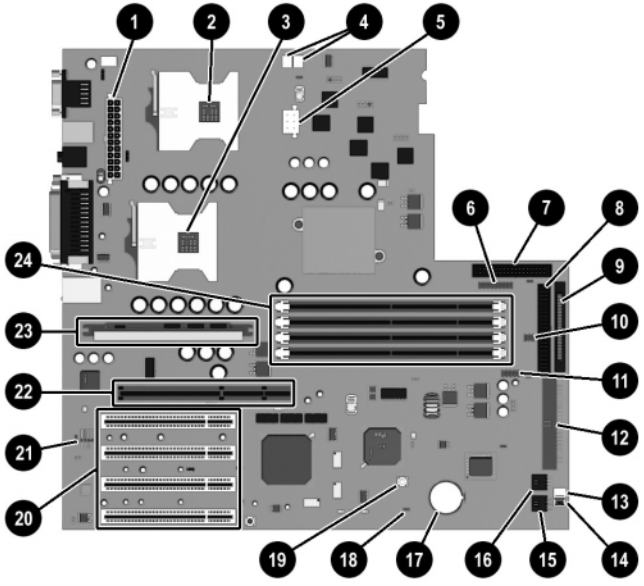
System Board Components



System board components

❶ 24-pin power supply connector	❾ SCSI connector
❷ Primary processor socket	❿ Hood sensor connector
❸ Secondary processor socket	⓫ Front USB connector
❹ Rear system fan connectors	⓬ Secondary ATA connector
❺ CPU power connector	⓭ Front chassis fan connector
❻ Power button header	⓮ Internal speaker connector
❼ Diskette drive connector	⓯ CD-ROM audio connector
❽ Primary ATA connector	⓰ Auxiliary audio connector

System Board Components *(Continued)*



System board components

⓱ Battery	㉑ Front audio connector
⓲ Password header	㉒ AGP Pro socket
⓳ CMOS reset switch	㉓ Secondary Processor Voltage Regulator Module (VRM)
⓴ Four PCI slots	㉔ Four DIMM sockets

Audio System

Your workstation has an integrated audio solution that supports analog or digital external stereo speakers. The system is capable of autosensing the speaker type and outputting the correct signal. The autosensing is done by detecting if there is a mono jack plugged into the line-out connector.

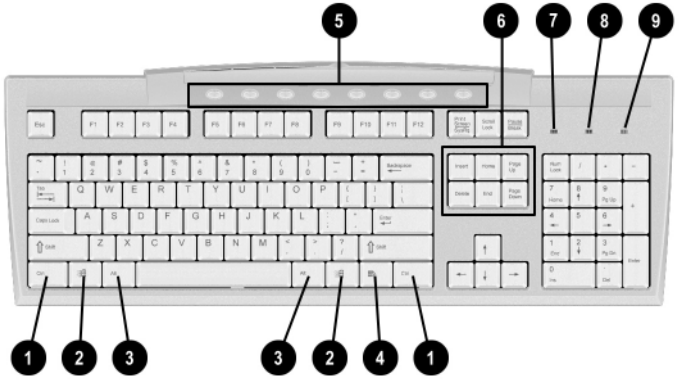
If you are using a set of digital speakers that have a stereo jack, and you want the system to auto-switch to digital, you will need to use a stereo-to-mono adapter to get the autosensing to work. However, if you do not have a stereo-to-mono adapter present, then you can manually switch the audio signal from analog to digital. See "Solving Audio Problems" in the *Troubleshooting Guide* on the *Documentation Library* CD for instructions on how to manually switch the audio signal for your operating system.

If you are using a headphone set that is mono, the system will attempt to switch to digital and you will experience "noise" or "silence." This can be fixed by manually switching the signal to analog. See "Solving Audio Problems" in the *Troubleshooting Guide* on the *Documentation Library* CD for instructions on how to manually switch the audio signal for your operating system.

If your analog speakers or headphones are not working, make sure you are not using a mono adapter with autosensing enabled.

Keyboard

Your workstation ships with an Easy Access Keyboard. The following figure identifies the location of keyboard lights and special function keys.



Easy Access Keyboard components

Easy Access Keyboard

Ref	Component	Function
❶	**Ctrl** key	Used in combination with another key; its effect depends on the application software you are using.
❷	Windows Logo Key	Used in combination with other keys to perform other functions (see "Windows Logo Key" later in this section).
❸	**Alt** key	Used in combination with another key; its effect depends on the application software you are using.
❹	Application key*	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application; may perform other functions in other software applications.
❺	Easy Access keys	Provides quick and easy access to favorite Web sites, applications, and services.

*Available only in selected geographic regions.

Easy Access Keyboard *(Continued)*

Ref	Component	Function
❻	Editing keys	Includes the following: **Insert, Home, Page Up, Delete, End,** and **Page Down.** ✎ Holding down **Ctrl + Alt + Delete** allows you to restart your computer.
❼	Num Lock light	Indicates whether the Num Lock feature is on or off.
❽	Caps Lock light	Indicates whether the Caps Lock feature is on or off.
❾	Scroll Lock light	Indicates whether the Scroll Lock feature is on or off.

Easy Access Software

Your Easy Access Keyboard Buttons are programmed to default assignments. The preinstalled Easy Access Software allows you to reprogram the Easy Access Buttons to reflect your personal preferences. The buttons can be reprogrammed to any program or service of your choice or to any Web site (URL).

Reprogramming the Easy Access Buttons

The Easy Access Keyboard icon is located on the Windows desktop status bar. Refer to the Readme-user.txt file for instructions about reprogramming the Easy Access Buttons.

Locking and Unlocking the Easy Access Buttons

The System Administrator can lock and unlock the Easy Access Buttons. Once locked, the buttons can only be reprogrammed by modifying the .bcf file. For administrative privileges, which require control of the Easy Access Button destinations, refer to the Readme-admin.txt file.

Easy Access Paper Icon Insert

The paper icon insert functions as a visual aid in identifying the programmed destination of each Easy Access Button. Whenever you reprogram an Easy Access Button, use the Paper Insert Template document to select and print an icon that reflects the new button assignment. The Paper Insert Template.doc is installed, by default, under C:\Program files\Compaq\Easy Access Keyboard.

For proper alignment, the spacing around the icons may require adjustment.

Windows Logo Key

Use the Windows Logo Key in combination with other keys to perform certain functions available in the Windows operating systems.

Windows Logo Key + **F1**	Displays a pop-up menu for the selected object
Windows Logo Key + **Tab**	Activates the next Taskbar button
Windows Logo Key + **E**	Launches Explore My Computer
Windows Logo Key + **F**	Launches Find Document
Windows Logo Key + **Ctrl** + **F**	Launches Find Computer
Windows Logo Key + **M**	Minimizes all open applications
Shift + Windows Logo Key + **M**	Undoes Minimize All
Windows Logo Key + **R**	Displays the Run dialog box

Special Mouse Functions

Most software applications support the use of a mouse. The functions assigned to each mouse button depend on the software applications you are using.

Serial Number Location

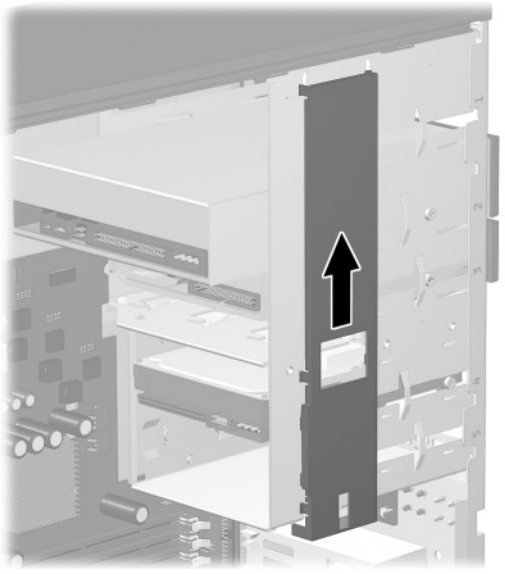
Each computer has a unique serial number located on the corner of the computer access panel and on the rear panel of the computer. Keep this number available for use when contacting customer support.

Changing from a Minitower to a Desktop Configuration

To change from a minitower to a desktop configuration:

1. Shut down the operating system properly, then turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet, then disconnect the network cable and any external devices from the system.
3. Remove the workstation access panel. See “Removing the Workstation Access Panel” in Chapter 2.
4. Remove the front bezel. See “Removing the Front Bezel” in Chapter 2.
5. Disconnect all power and data cables from the drives in the 5.25-inch drive bays.

6. To release a drive from the 5.25-inch drive bay, slide the drivelock as shown. Carefully push the drive from the back of the unit until the drive casing can be grasped.



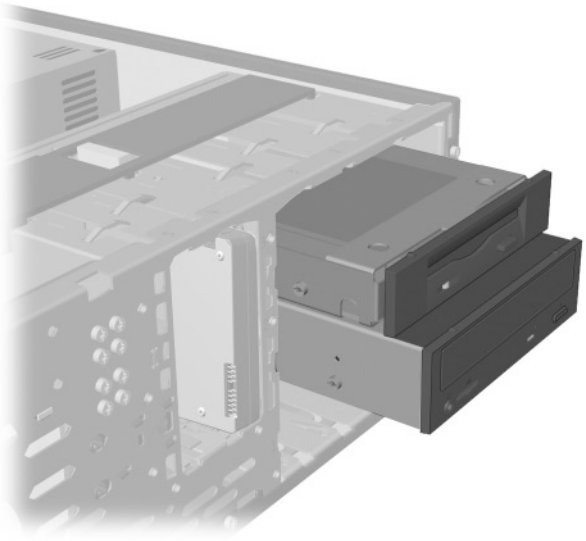
Releasing the drives with the drivelock

CAUTION: Do not hold the face plate while removing a drive. Only hold a drive by its casing.

7. While holding the drive casing, gently pull the drive out.

CAUTION: When removing a drive, do not pull the drive from the front of the drive bay. To prevent damage to the drive bezel, push the drive and drive casing from the rear for removal from the front of the drive bay.

8. After placing the workstation in the desktop position, gently slide the drives back into the bay.



Installing the drives

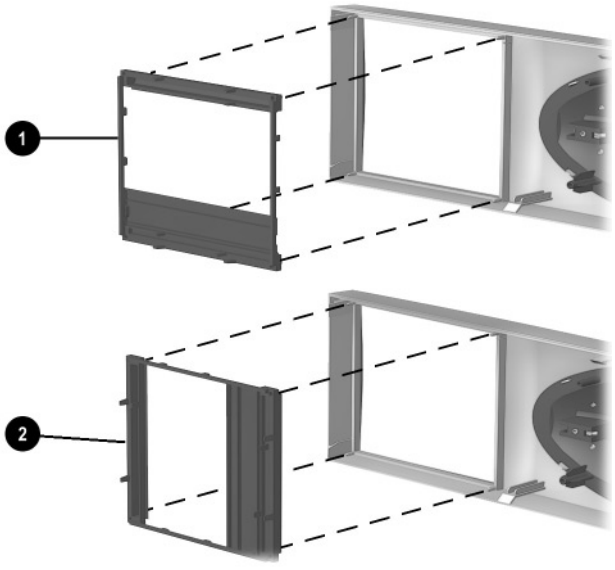
CAUTION: The use of unnecessary force when installing the drive may result in damage to the drive.

In the desktop configuration, always place the diskette drive in the bay nearest the top of the chassis (bay 3) to ensure proper drive clearance and access. When all of the drives are properly inserted, the drivelock will secure the drives in place.

9. Reconnect the power and data cables to the drives as labeled.

10. Remove the subpanel ❶ as described in "Removing the Bezel Blank" in Chapter 2, and reposition the subpanel ❷ with the bezel blank in the proper orientation for the desktop configuration.

CAUTION: Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.



Changing from a minitower to a desktop configuration

When converting from a minitower to a desktop orientation, use the replacement subpanel that was shipped with your workstation to ensure that the HP logo is properly oriented.

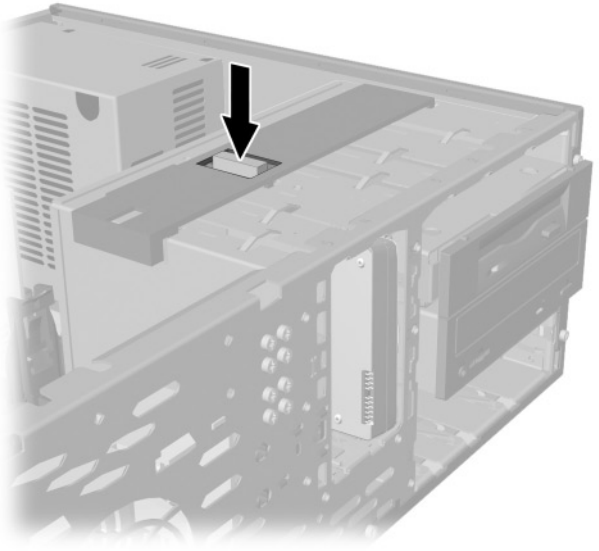
11. Replace the subpanel, front bezel, and the workstation access panel. Be sure that the subpanel and front bezel align properly with the alignment tabs.
12. Reconnect the power cord to the grounded AC outlet, then reconnect the network cable and any external devices to the system.

Changing from a Desktop to a Minitower Configuration

To change from a desktop to a minitower configuration:

1. Shut down the operating system properly, then turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet, then disconnect the network cable and any external devices from the system.
3. Remove the workstation access panel. See “Removing the Workstation Access Panel” in Chapter 2.
4. Remove the front bezel. See “Removing the Front Bezel” in Chapter 2.
5. Disconnect all power and data cables from the drives in the 5.25-inch drive bays.

6. To release a drive from the 5.25-inch drive bay, press the drivelock as shown.



Releasing the drives with the drivelock

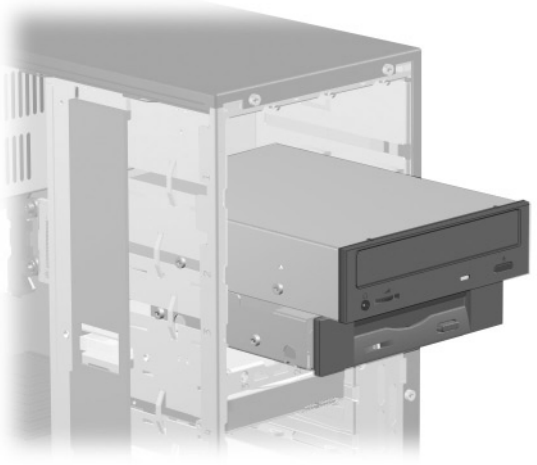
7. While pressing the drivelock button, push the drive from the back of the unit until the drive casing can be grasped.

CAUTION: Do not hold the face plate while removing a drive. Only hold a drive by its casing.

8. While holding the drive casing, gently pull the drives out.

CAUTION: When removing a drive, do not pull the drive from the front of the drive bay. To prevent damage to the drive bezel, push the drive and drive casing from the rear for removal from the front of the drive bay.

9. After placing the workstation in the minitower position, gently slide the drives back into the bay.



Installing the drives

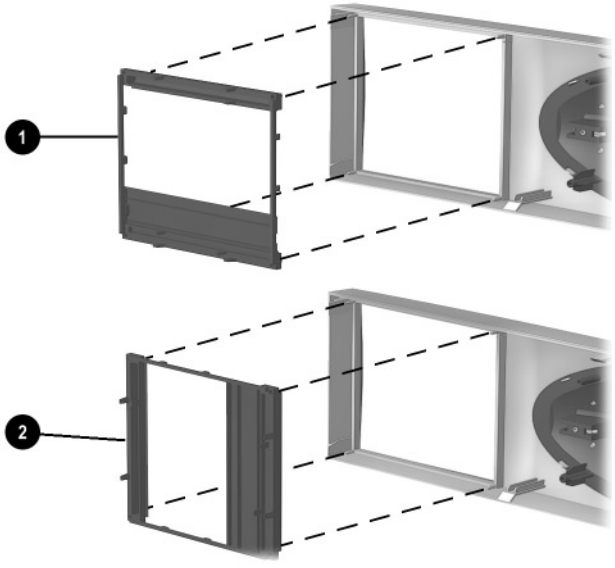
CAUTION: The use of unnecessary force when installing the drives may damage the drives.

In the minitower configuration, always place the diskette drive in the third bay from the top of the chassis to ensure proper drive clearance within the chassis. When all the drives are properly inserted, the drivelock will secure the drives in place.

10. Reconnect the power and data cables to the drives as labeled.

11. Remove the subpanel ❶ as described in "Removing the Bezel Blank" in Chapter 2, and reposition the subpanel ❷ with the bezel blank in the proper orientation for the minitower configuration.

CAUTION: Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.



Changing from a desktop to a minitower configuration

When converting from a desktop to a minitower orientation, use the replacement subpanel that is shipped with your workstation to ensure that the HP logo is properly oriented.

12. Replace the subpanel, front bezel, and the workstation access panel. Be sure that the subpanel and front bezel align properly with the alignment tabs.
13. Reconnect the power cord to the grounded AC outlet, then reconnect the network cable and any external devices to the system.

2

Hardware Upgrades

This chapter explains how to remove the workstation access panel and the front bezel. It also explains how to install the following hardware components:

- Memory
- Drives
- Expansion boards
- Processors

Finish the setup procedures for the preinstalled software before you install any optional hardware or third-party devices that were not included with your workstation.

Installation Sequence

Follow this sequence of steps to ensure the proper installation of any optional equipment. Before you begin, observe the following precautions.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacles.

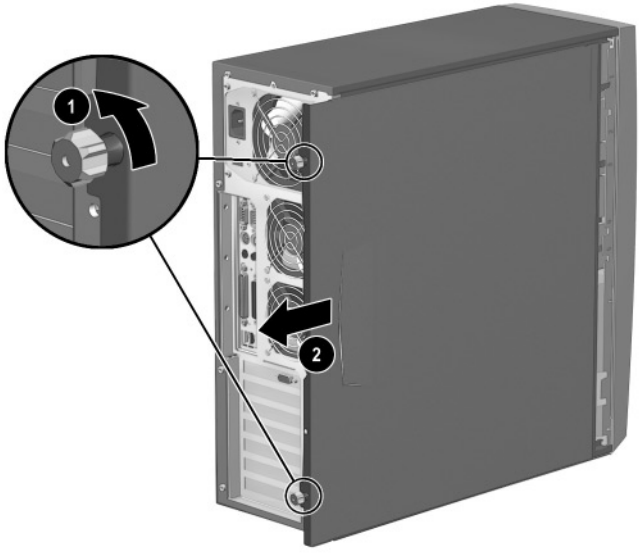
CAUTION: Static electricity can damage the electronic components of the workstation or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Disconnect the keyboard, monitor, mouse, network cable, and other external equipment connected to the workstation.
3. Open the workstation by removing its workstation access panel. See "Removing the Workstation Access Panel" in this chapter.
4. If you are installing or removing drives in the front bays, see "Removing the Front Bezel" in this chapter for instructions.
5. Install any optional equipment, such as memory, additional drives, expansion boards, processors, or batteries. See the appropriate sections in this chapter or the appendixes for installation instructions. Also refer to the documentation provided with the optional equipment.
6. Replace the front bezel and the workstation access panel, if necessary.
7. Reconnect the keyboard, mouse, monitor, network cable, and other external devices.
8. Plug the power cord into a grounded AC outlet.
9. Turn on the monitor, workstation, and any external devices you have installed.
10. Reconfigure the workstation, if necessary.
11. Test the workstation (optional) using the TEST utility.

Removing the Workstation Access Panel

To remove the workstation access panel:

1. Shut down the operating system properly, then turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet.
3. Loosen the two thumbscrews ❶ as shown in the following illustration.
4. Slide the access panel ❷ back.



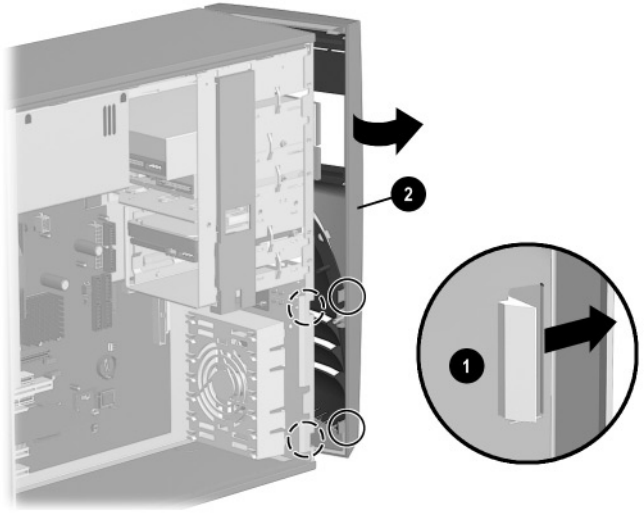
Loosening the two thumbscrews and removing the workstation access panel

When replacing the workstation access panel, be sure to tighten both thumbscrews.

Removing the Front Bezel

To remove the front bezel:

1. Shut down the operating system properly, then turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet.
3. Remove the workstation access panel. See "Removing the Workstation Access Panel" in this chapter.
4. Remove the bezel:
   a. Push in on the two front bezel release latches ❶.
   b. Rotate the front bezel away from the chassis ❷ to release it.



Pressing the tabs to remove the front bezel

When replacing the front bezel, ensure that the bottom hinge points are properly placed in the chassis before rotating the front bezel back into its original position.

Installing Additional Memory

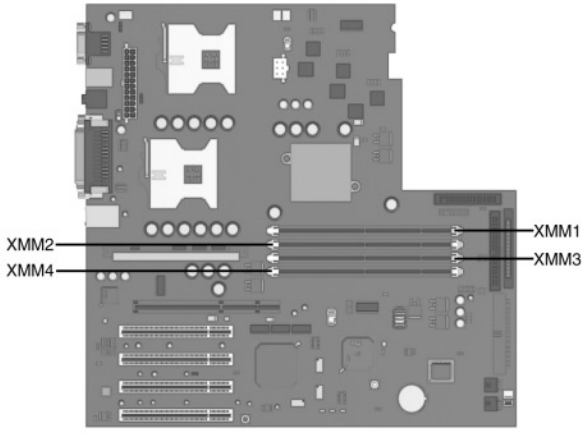
Your workstation comes with Double Data Rate-Synchronous dynamic random access memory (DDR-SDRAM) dual inline memory modules (DIMMs).

The memory sockets on the system board can be populated with industry-standard DIMMs. These sockets are populated with two preinstalled memory modules. To achieve the maximum memory support, you may be required to replace the preinstalled DIMMs with higher capacity DIMMs. You can also install additional DIMMs in the two unpopulated memory sockets.

DIMM Socket Locations

Your workstation supports a total of four DIMM sockets on two channels (two sockets per channel). DIMMs must be installed in identical pairs for dual channel operation.

The four DIMM sockets are numbered XMM1 and XMM3 (on channel A) and XMM2 and XMM4 (on channel B). Refer to the following figure for their locations on the system board.



DIMM socket locations

DIMM Installation Guidelines

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: To reduce the risk of personal injury when replacing or removing DIMMs, allow the module being removed from the DIMM socket sufficient time to cool. DIMM temperatures can reach 212° F (100° C).

CAUTION: When handling a memory module, do not touch any of the contacts. Doing so may damage the module.

CAUTION: Static electricity can damage the electronic components of the workstation or option boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. Refer to Appendix E, "Electrostatic Discharge," for more information.

When installing DIMMs, follow these guidelines:

- When installing additional memory modules, you must install two DIMMs of identical type and speed into the unpopulated memory sockets.
- For proper system operation, if your system supports DDR-SDRAM DIMMs, the DIMMs must be industry-standard 184-pin, Registered ECC PC 2100 266 MHz-compliant, 2.5 volt DDR-SDRAM DIMMs. The DDR-SDRAM DIMMs must support CAS Latency 2 or 2.5 (CL = 2 or CL = 2.5). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information.
- DIMMs must be installed correctly. Be sure to match the keyed slot on the DIMM with the tab on the DIMM socket. Push the DIMM down into the DIMM socket, ensuring that it is fully inserted and properly seated and that the retaining arms are locked in place.

- Install DIMMs in pairs across both memory channels. Each DIMM socket populated with a DIMM on Channel A must be populated with an identical DIMM on Channel B. For examples of the correct configuration sequence, see the "DIMM Installation Configurations" section later in this chapter.
- Do not mix DIMMs with different memory speeds. Performance will reflect the slowest speed DIMM.
- Use only DIMMs that have been tested and approved by HP. Not all DIMMs meet the HP standard for quality and reliability.

CAUTION: Your workstation will not function if the previous guidelines are not followed when installing DIMMs.

DIMM Installation Configurations

When installing DIMMs, you must use the configurations in the following table.

DIMM Installation Configurations

Possible Configuration	Memory Channel A		Memory Channel B	
	DIMM Socket	DIMM Socket	DIMM Socket	DIMM Socket
	XMM1	XMM3	XMM2	XMM4
1	DIMM		DIMM	
2		DIMM		DIMM
3	DIMM	DIMM	DIMM	DIMM

Identical pairs for dual channel operation means XMM1 and XMM2 must have the same type of DIMM and XMM3 and XMM4 must have the same type of DIMM for a fully populated system.

If you are only putting in two modules then they must be the same and go in either XMM1 and XMM2 or XMM3 and XMM4. You must have one in each channel for dual channel operation.

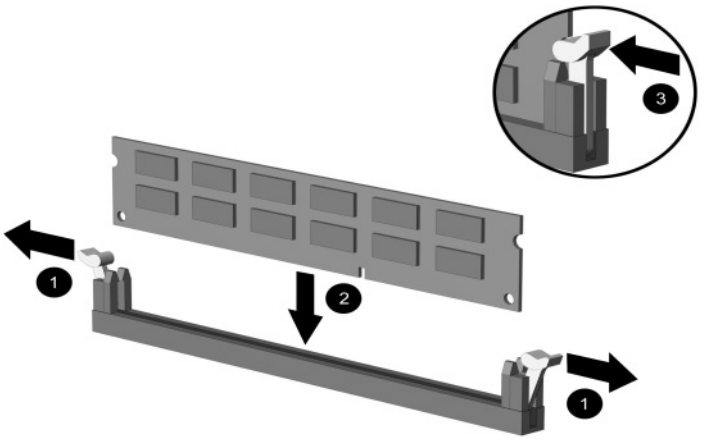
Installing DIMMs

To install a DIMM:

1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel.
3. Locate the DIMM sockets.

CAUTION: Be sure to follow the correct configuration guidelines or your system will not function.

4. Refer to the following illustrations to install memory modules.



Installing a DIMM

5. Reassemble the workstation.

Removing DIMMs

To remove a memory module from a DIMM socket, reverse the procedures in the previous section.

Installing Additional Drives

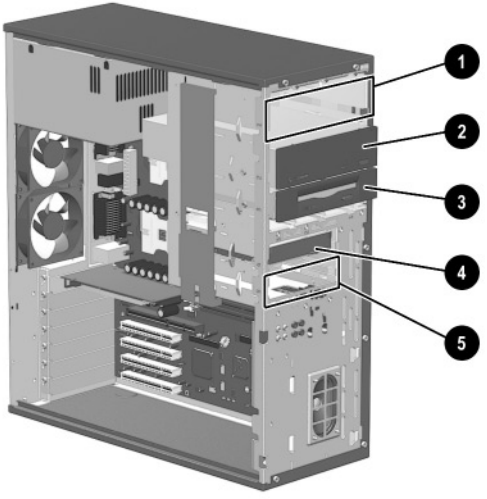
This section provides a description of the drive bay components. Instructions for removing a bezel blank and how to install or remove a drive are also included.

Drive Bay Components

Your workstation supports up to five drive bays. Drive bays 1 through 3 are located on the front of the workstation. Bays 4 and 5 are located inside the workstation. Your system supports various drive configurations.

Minitower Drive Bay Positions

Drive bay numbers are stamped on the chassis behind the front bezel.

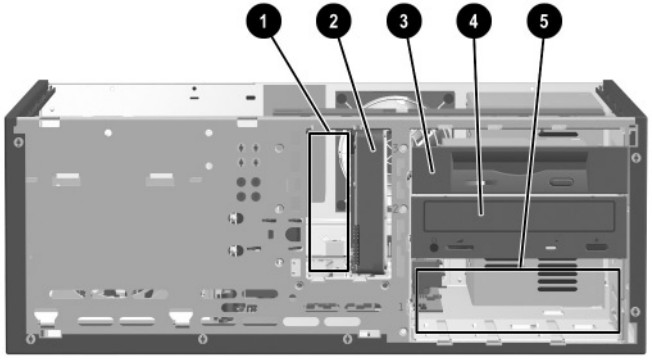


Identifying minitower drive bay components

Minitower Drive Bay Components

Bay	Drive Component
❶	5.25-inch, half-height bay for optional drive.
❷	5.25-inch, half-height bay for optional drive. A CD-ROM drive is shipped in bay 2.
❸	3.5-inch, diskette drive mounted in the 5.25-inch, one-third height bay.
❹	3.5-inch, one-third height bay for hard drive. A hard drive is shipped in bay 4.
❺	3.5-inch, one-third height bay for hard drive.

Desktop Drive Bay Positions



Identifying desktop drive bay components

Drive Bay Components

No.	Bay	Drive Component
❶	5	3.5-inch, one-third height bay for hard drive.
❷	4	3.5-inch, one-third height bay for hard drive.
❸	3	3.5-inch, diskette drive mounted in the 5.25-inch, one-third height bay.
❹	1	5.25-inch, half-height bay for optional drive.
❺	2	5.25-inch, half-height bay for optional drive.

Preparing for Drive Installation

Remove the drive bezel blank before installing any removable media storage device, such as a tape drive, CD-ROM or DVD-ROM drive, or diskette drive, into these bay locations.

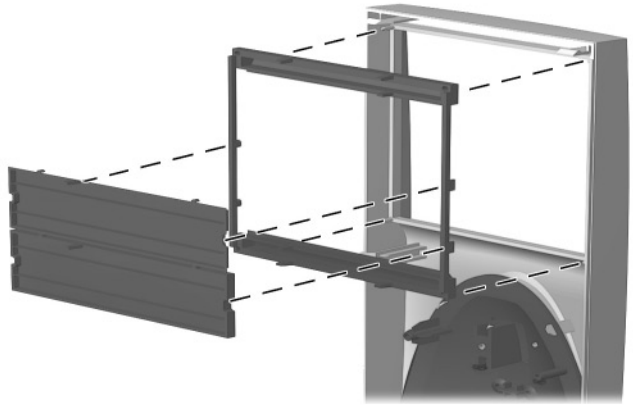
Removing the Bezel Blank

To remove the bezel blank:

1. Shut down the operating system properly, then turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet.
3. Remove the workstation access panel. See “Removing the Workstation Access Panel” in this chapter.
4. Remove the front bezel. See “Removing the Front Bezel” in this chapter.

5. Gently pull the subpanel, with the bezel blank still secured, away from the front bezel. Remove the bezel blank from the subpanel.

CAUTION: Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.



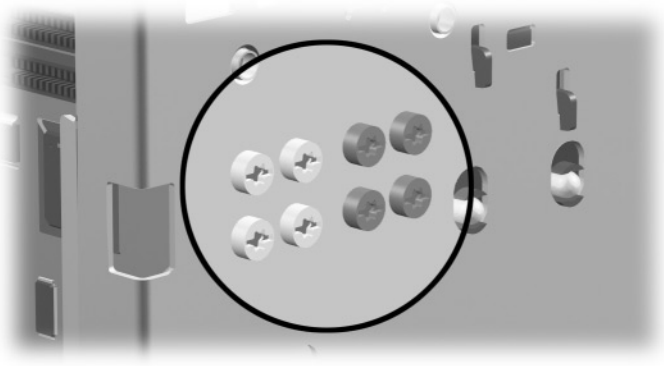
Removing the bezel blank from the subpanel

When replacing the subpanel, ensure that the aligning pins are properly oriented.

When converting from a minitower to a desktop orientation, use the replacement subpanel that is shipped with your workstation to ensure that the HP logo is properly oriented.

Locating the Hardware Screws

Your workstation has extra guide screws stored behind the front bezel. Install these screws to ensure that the drive lines up correctly in the drive bay. Some options use M3 metric hardware. HP supplied metric screws are black.



Identifying the guide screws

Installing a Hard Drive

The following sections provide instructions for installing a hard drive into a 3.5-inch drive bay and into a 5.25-inch drive bay.

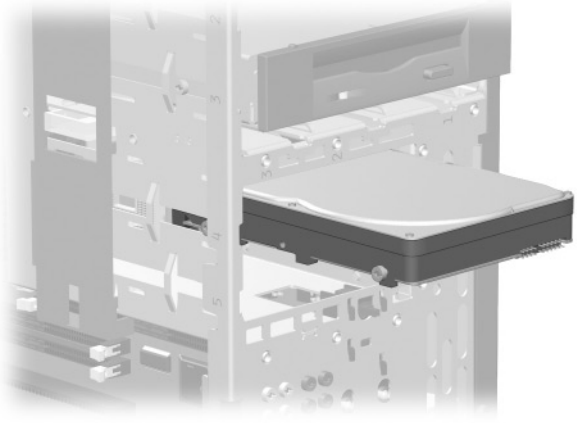
Installing a Hard Drive into a 3.5-Inch Drive Bay

Prior to installing a SCSI device, read the section "SCSI Devices" in Appendix B.

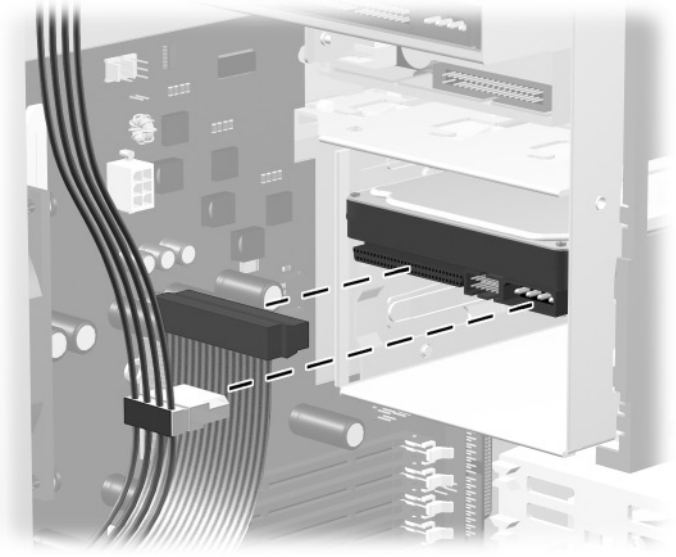
To install a hard drive into a 3.5-inch drive bay:

1. Shut down the operating system properly, then turn off the workstation. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See "Removing the Workstation Access Panel" in this chapter.
3. Remove the front bezel. See "Removing the Front Bezel" in this chapter.

To install a hard drive into a 3.5-inch bay, see the following two illustrations.



Installing a hard drive into a 3.5-inch hard drive bay



Connecting the signal cable and power cable

4. Connect the ends of the cables to the appropriate system board connectors. To locate the appropriate drive connectors, see "System Board Components" in Chapter 1.
5. Reassemble the workstation.

Installing a Hard Drive into a 5.25-Inch Drive Bay

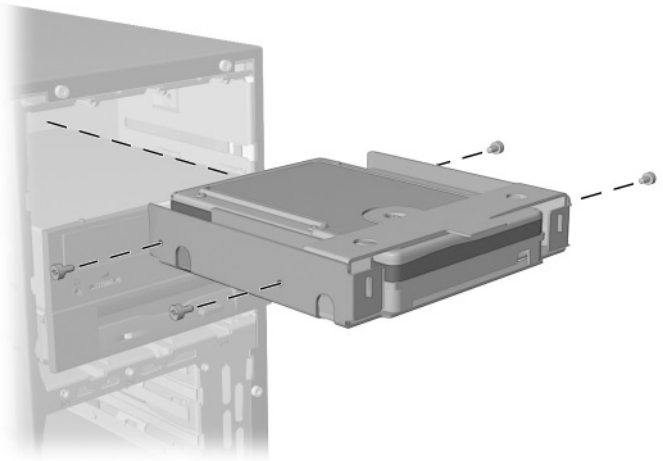
To install a 3.5-inch hard drive into a 5.25-inch, half-height drive bay, the drive must be housed in an adapter.

Prior to installing a SCSI device, read the section "SCSI Devices" in Appendix B.

To install the drive and adapter:

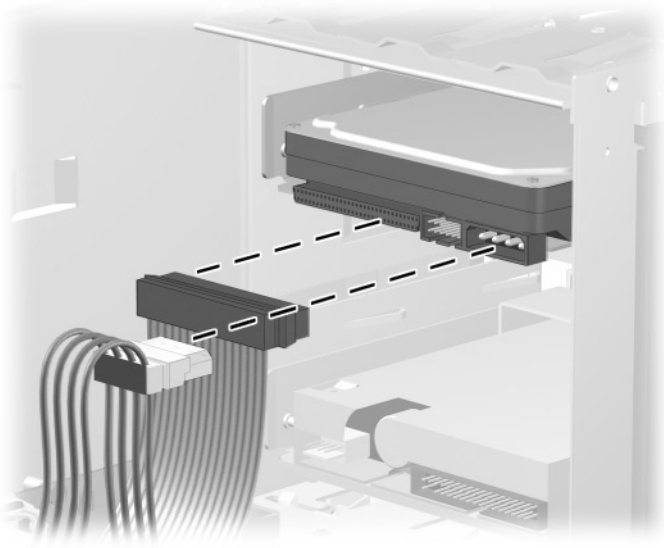
1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See "Removing the Workstation Access Panel" in this chapter.
3. Remove the front bezel. See "Removing the Front Bezel" in this chapter.

4. Remove four of the guide screws from behind the front bezel on the workstation chassis. See “Locating the Hardware Screws” in this chapter.
5. Secure the drive to the hard drive adapter by installing the four guide screws into the drive as shown in the following illustration.



Aligning the guide screws and installing a 3.5-inch drive

6. Install the adapter in the drive bay by sliding it into the front of the drive cage. The drivelock automatically secures the adapter when the drivelock snaps into place.



Connecting the signal and power cables

7. Connect the opposite end of the cables to the appropriate system board connectors. To locate the appropriate drive connectors, see "System Board Components" in Chapter 1.
8. Reassemble the workstation.

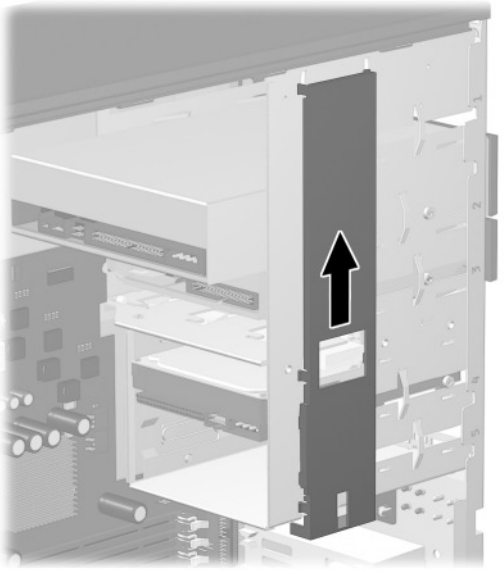
Removing a Drive

If you are replacing the Ultra ATA hard drive in your workstation with a SCSI hard drive, you will need a multimode LVD SCSI cable option kit.

Complete the following steps to remove a drive:

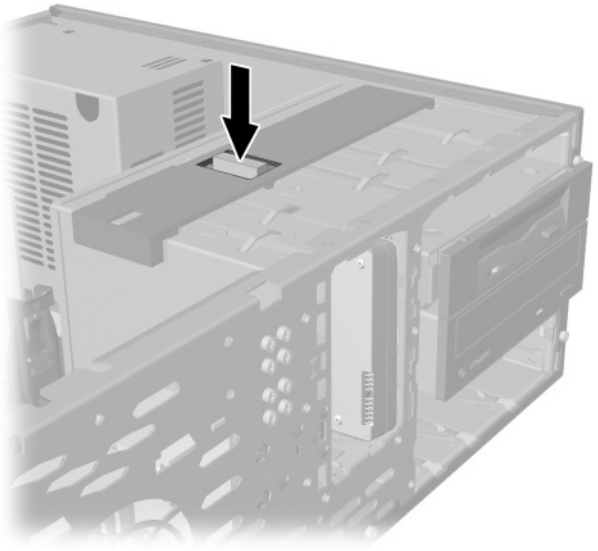
1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See “Removing the Workstation Access Panel” in this chapter.
3. Remove the front bezel. See “Removing the Front Bezel” in this chapter.

4. Disconnect the drive power and signal cables. If the drive is a CD-ROM drive, disconnect the audio connector.
5. Release the drivelock.
   - ❑ If the drive is in the minitower position, slide the drivelock to release the drive in the drive bay.



Releasing a drive with the drivelock

❏ If the drive is in the desktop position, press the drivelock button to release the drive in the drive bay.



Releasing the drives with the drivelock button

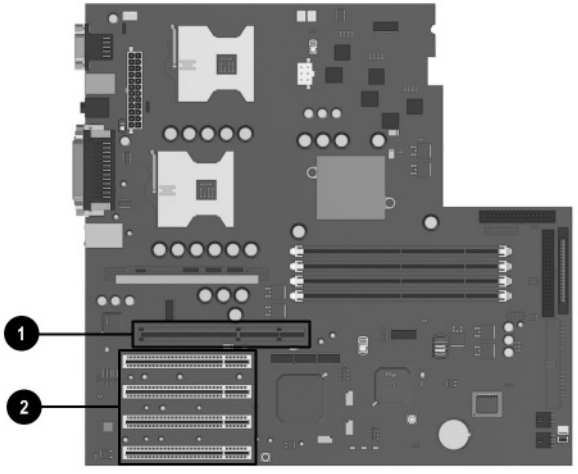
6. While releasing the drivelock, push from the back of the drives until the drive casing can be grasped from the front of the workstation.
7. While holding the drive casing, pull the drives out of the drive bay.
8. Store the drives in antistatic packaging.
9. Reassemble the workstation.

Installing and Removing an Expansion Board

This section provides instructions for installing and removing PCI and AGP expansion boards.

Identifying the AGP and PCI Sockets

Your workstation contains one Accelerated Graphics Port (AGP) socket and four 32-bit, 33-MHz Peripheral Component Interconnect (PCI) sockets. The following illustration identifies the physical locations of these sockets.



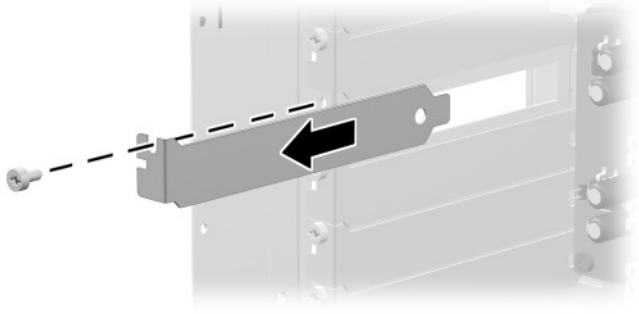
Locating the AGP and PCI sockets

❶	One AGP socket
❷	Four PCI sockets

Installing an Expansion Board

To install an expansion board:

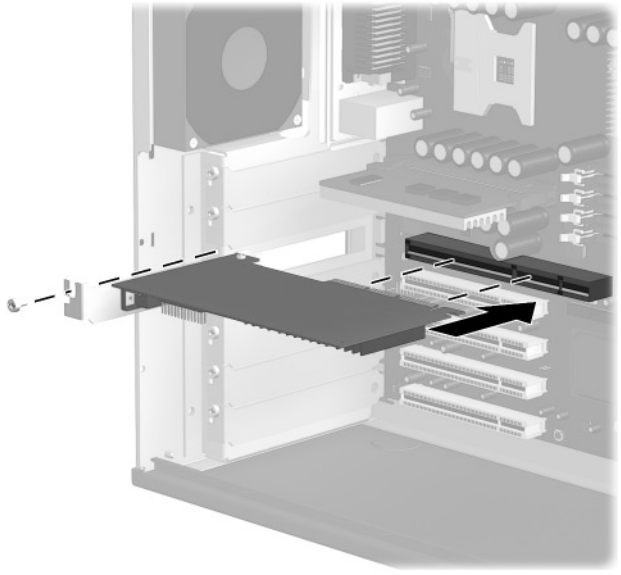
1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See “Removing the Workstation Access Panel” in this chapter.
3. Locate a vacant AGP or PCI socket, depending on the type of board that you are installing.
4. Remove the screw securing the expansion slot cover, then remove the slot cover, as illustrated.



Removing the screw and expansion slot cover

5. Slide the expansion board into the socket. Press firmly on the board so that the whole connector seats properly in the socket.

If installing an AGP expansion board, the board must have an ATX bracket.



Installing an expansion board

6. Replace the screw to secure the board in the socket.
7. Reassemble the workstation.
8. Reconfigure the workstation, if necessary.

Removing an Expansion Board

To remove an expansion board, reverse the steps in the previous section. When reversing these steps:

- Be sure to store the board in antistatic packaging.
- Install an expansion slot cover to close the open slot.

Installing an Additional Processor

You can upgrade your workstation to a multiprocessor system. When you install a second processor, it must be the same speed, cache size, and type as the existing processor.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Static electricity can damage the electronic components of the workstation. Before beginning these procedures, be sure you are discharged of static electricity by briefly touching a grounded metal object.

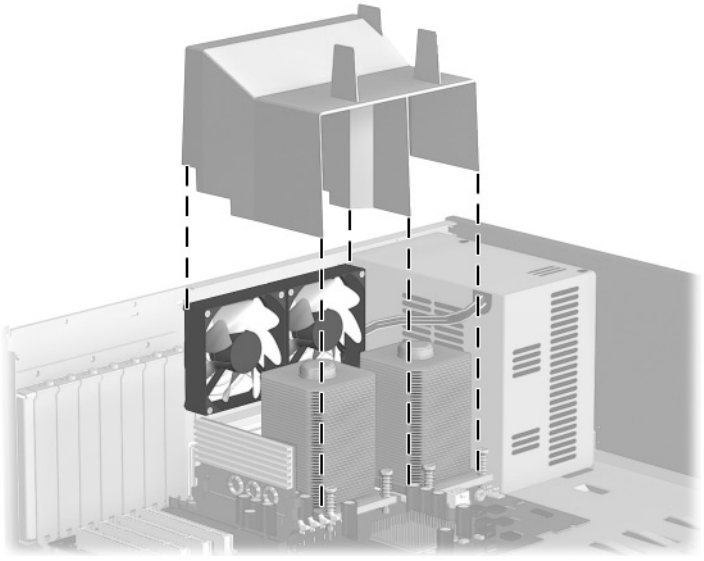
CAUTION: Installing the processor incorrectly may damage the system board. Have an HP authorized reseller or service provider install the processor. If you plan to install it yourself, read all of the instructions carefully before you begin.

Before installing a second processor, you must remove the air baffle.

To remove the air baffle:

1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See “Removing the Workstation Access Panel” in this chapter.
3. Place the workstation in the desktop position.

4. Remove the air baffle:
   a. Gently pull up on the air baffle until it comes loose from the fan assembly.
   b. Lift the air baffle out of the chassis.



Removing the air baffle

5. Install the second processor (refer to the illustration on the following page):

   a. Open the secondary processor socket lever ❶ fully (the full swing angle of the lever is approximately 135 degrees).

CAUTION: Processor pins are delicate and bend easily. Use extreme care when placing the processor in the socket.

   b. Line up the two keyed corners of the pins on the processor ❷ with the two keyed corners of the processor socket and install the processor into the socket. Ensure that the underside of the processor is level with the top of the processor socket.

CAUTION: If only one processor is installed, and you are replacing that processor, be sure to install the processor in the primary processor socket or your workstation will not function.

   c. Lightly press down on the top of the processor while closing the socket lever.

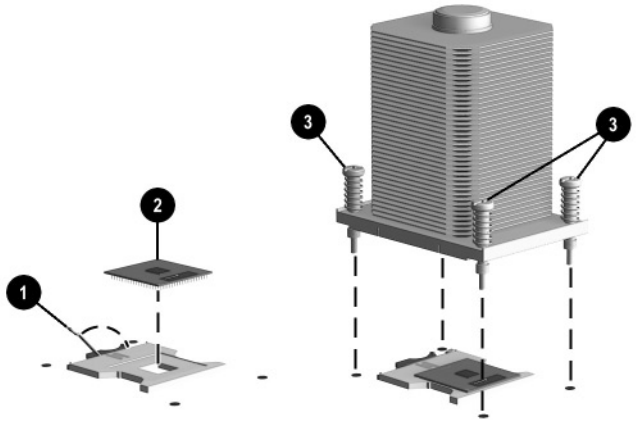
   d. Check for proper processor seating in the socket. Using your fingers, carefully try to lift the processor out of the socket. A properly seated processor will not lift out of the socket.

e. Place the thermal grease on the bottom of the heatsink before setting the heatsink on top of the processor.

Your workstation may come preinstalled with screws around the second processor area where the new heatsink will attach. Remove these screws before installing the new heatsink.

f. Line up the captive screws with the holes on the system board.

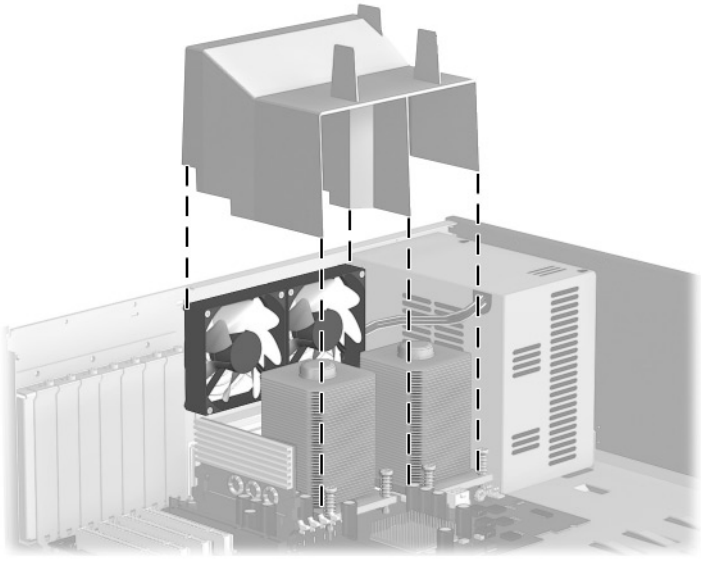
g. Tighten the screws ❸ until they no longer turn and the spring is fully compressed.



Installing a second processor/heatsink assembly

6. Reinstall the air baffle:
   a. Carefully lower the air baffle into the chassis over the heatsinks.
   b. Gently press down on the air baffle until it fits into the fan assembly.

CAUTION: The air baffle is essential to proper cooling of the processors. Without it, the processor will slow down to avoid overheating.



Reinstalling the air baffle

7. Reassemble the workstation and connect the power cord to the grounded AC outlet.

When replacing the workstation access panel, be sure to tighten both thumbscrews. The air baffle is held in place when the workstation access panel is secured.

A manual Hardware Abstraction Layer (HAL) upgrade is necessary when installing a second processor **after** the system has gone through the software unbundling process. If a second processor is installed prior to unbundling, a manual upgrade is **not** necessary. HP recommends that the software unbundling process be completed prior to installing additional components. For information about upgrading to a multiprocessor HAL, refer to the documentation included in your processor upgrade kit.

Upgrading a Processor

You can upgrade your workstation by replacing an existing processor with a faster processor. Before replacing an existing processor, you will need to purchase the necessary hardware option kit. Please follow the guidelines and procedures provided in the following sections to upgrade your processor.

Preparing for a Processor Upgrade

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Installing the processor incorrectly may cause damage to the system board. Have an HP authorized reseller or service provider install the processor. If you choose to install it yourself, read all of the instructions carefully before you begin.

CAUTION: Static electricity can damage the electronic components of the workstation. Before beginning these procedures, be sure that you are discharged of static electricity by briefly touching a grounded metal object.

Hardware Components Required

To upgrade your processor, contact your authorized service provider to purchase the necessary hardware option kit. This kit contains the following items:

- Processor
- Alcohol swab
- Heatsink with thermal grease

Guidelines for Separating the Heatsink/Processor Assembly

Before upgrading your workstation with a new processor, the following sequential events must take place in order to remove the existing heatsink and processor assembly:

1. The heatsink and processor assembly is to be heated to an optimum temperature to break the compound bonding them together. See the following sections:
   - ❏ "Heatsink Cool-Down Time"
   - ❏ "Heatsink Warm-Up Time"
2. The heatsink is to be separated from the processor.
3. The processor is to be released from the processor socket.

Heatsink Cool-Down Time

The heat generated from the processor core transfers to the heatsink making the assembly too hot to handle. From a power-on state to a power-off state, it takes five minutes to cool the heatsink sufficiently so that it can be handled comfortably yet keep the compound pliable that is holding the processor to the heatsink.

Heatsink Warm-Up Time

Minimal warm-up time is required to generate enough heat to soften the compound holding the heatsink to the cold processor.

CAUTION: Lifting the heatsink straight up while it is in a cold state can result in damage to the processor, because it may prematurely pull the heatsink and processor assembly out of the processor socket. If this should occur, you will need to open the processor socket by lifting up on the processor retention lever before attempting to install the new processor.

From a power-off state to a power-on state, the heatsink must be warmed (but not overheated) so that the heatsink can be handled comfortably, yet keep the compound pliable that is holding the processor to the heatsink.

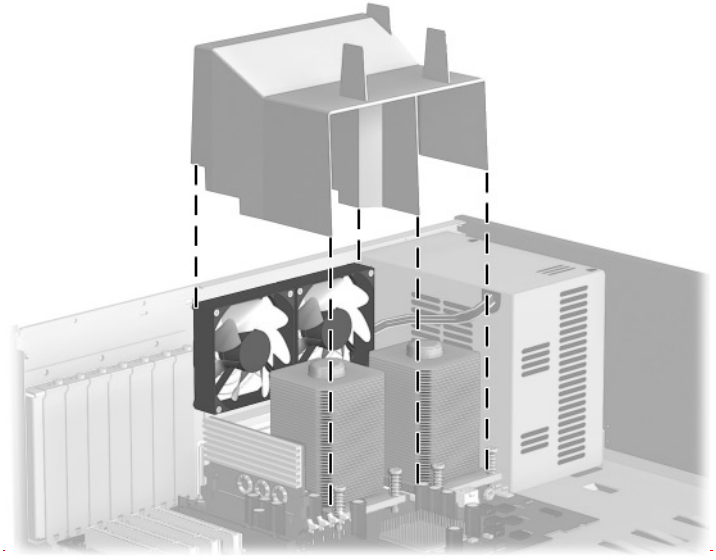
1. Turn on the workstation and allow the operating system to boot.
2. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.

Removing an Existing Processor

To remove an existing processor:

1. Shut down the operating system properly, then turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet.
2. Remove the workstation access panel. See “Removing the Workstation Access Panel” in this chapter.
3. Place the workstation in the desktop position.

4. Remove the air baffle:
   a. Gently pull up on the air baffle until it comes loose from the fan assembly.
   b. Lift the air baffle out of the chassis.



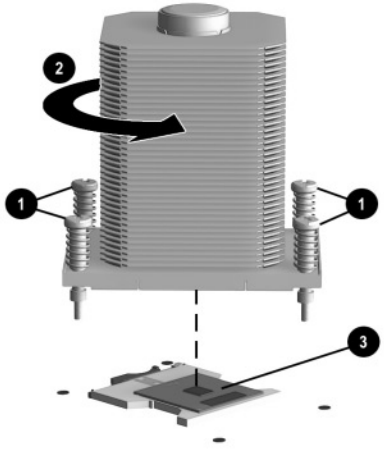
Removing the air baffle

5. Ensure that the heatsink is warm to the touch.

CAUTION: Lifting the heatsink straight up while it is in a cold state can result in damage to the processor, because it may prematurely pull the heatsink and processor assembly out of the processor socket. If this should occur, you will need to open the processor socket by lifting up on the processor retention lever before attempting to install the new processor.

If the heatsink is cold to the touch, see "Guidelines for Separating the Heatsink/Processor Assembly" in this chapter.

6. Remove the heatsink:
   a. Untighten the captive screws ❶.
   b. Twist the heatsink slightly ❷ to break the compound that is holding it to the processor.
   c. Lift the heatsink off the processor ❸.

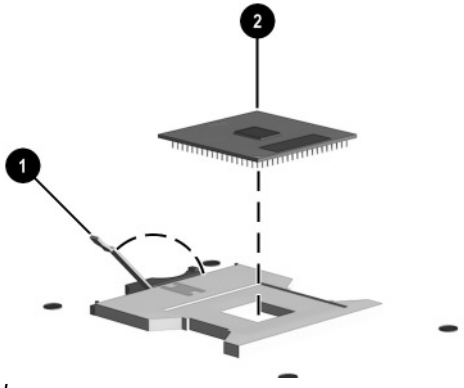


Twisting and lifting the heatsink off the processor

CAUTION: Lifting the heatsink straight up while it is in a cold state can result in damage to the processor, because it may prematurely pull the heatsink and processor assembly out of the processor socket. If this should occur, you will need to open the processor socket by lifting up on the processor retention lever before attempting to install the new processor.

If the heatsink is cold to the touch, see "Guidelines for Separating the Heatsink/Processor Assembly" in this chapter.

7. Remove the processor:
   a. Open the secondary processor socket lever ❶ fully (the full swing angle of the lever is approximately 135 degrees).
   b. Lift the processor out of the processor socket ❷.



Removing the processor

Installing a New Processor

To install a new processor, see the "Installing an Additional Processor" section in this chapter.

A

Specifications

hp workstation xw6000

Component	U.S.	Metric
Minitower Dimensions		
Height	17.65 in	44.83 cm
Width	6.60 in	16.76 cm
Depth	17.75 in	45.08 cm
Desktop Dimensions		
Height	6.60 in	16.76 cm
Width	17.65 in	44.83 cm
Depth	17.11 in	43.46 cm
Approximate Weight	32 lb	14.54 kg
Power Supply	115 VAC	230 VAC
Operating Voltage Range	90–132 VAC	180–264 VAC
Rated Voltage Range	100–127 VAC	200–250 VAC
Rated Line Frequency	50–60 Hz	50–60 Hz
Temperature		
Operating	50° to 95° F	10° to 35° C
Shipping	4° to 140° F	-15° to 60° C
Humidity (noncondensing)		
Operating	20% to 80%	
Nonoperating	10% to 90%	
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3,048 m
Nonoperating	30,000 ft	9,144 m
Power Output	460 W	460 W
Rated Input Current (maximum)	8.6 A	4.3 A
Heat Dissipation (maximum)	2641 BTU/hr	665 kg-cal/hr

B

Hard Drive Installation

Using the Cable-Select Feature with Ultra ATA Devices

Selected models of the HP workstation xw6000 have an internal Ultra ATA hard drive installed. The configuration of the drive employs a cable-select feature that identifies the drive as device 0 (primary drive) or device 1 (secondary drive).

Device 1 is the drive connected to the cable's middle connector. Device 0 is the drive connected to the cable's end connector (applies only to 80-conductor ATA cables). See "Guidelines for Installing Ultra ATA Devices" in this appendix for an example of an Ultra ATA cable.

HP hard drives ship with jumpers preset to cable-select mode; therefore, no jumper setting changes on the existing or optional drives are required. If you purchase a third-party hard drive, refer to the documentation included with the kit to ensure proper installation and configuration of cables.

If installing a second device on the primary controller, you must use an 80-conductor Ultra ATA cable for optimal performance. This cable is standard on selected models.

Guidelines for Installing Ultra ATA Devices

When installing additional Ultra ATA drives, follow these guidelines:

- If using multiple Ultra ATA devices, HP recommends that the devices be split between the primary and secondary Ultra ATA channels for optimum performance. Use an additional Ultra ATA cable to connect the additional devices to the system board.
- UATA-100 cable:

  18 inches maximum total length, 80-conductor cable with maximum spacing of 6 inches between Drive 0 and Drive 1

UATA-100 cable

❶ Device 0 (primary drive) connector

❷ Device 1 (secondary drive) connector

❸ System board connector

- For optimal performance, connect hard drives to the primary controller. Connect expansion devices, such as Ultra ATA CD-ROM drives, tape drives, and diskette drives, to the secondary controller.
- Install either a third-height or a half-height drive into a half-height bay.
- Install guide screws to ensure that the drive lines up correctly in the drive cage. HP has provided extra guide screws installed in the front of the workstation chassis behind the front bezel. Some options use M3 metric hardware. HP supplied metric screws are black.
- If only one device is connected to a cable, that device must be attached to the end (Device 0) connector.

SCSI Devices

This section contains information relating to SCSI device guidelines and installation.

Guidelines for Using SCSI Devices

When installing and operating SCSI devices, you must follow these guidelines:

- A single Ultra SCSI controller supports up to seven SCSI devices per channel.
- Each Wide-Ultra SCSI, Ultra-Wide SCSI, Wide Ultra2 SCSI, Ultra 320 SCSI, or Ultra 160 SCSI controller supports up to 15 SCSI devices per channel.
- If using multiple SCSI devices, HP recommends that the devices be split between Channel A and Channel B, if available, for optimum performance.
- SCSI cable recommendation:
  - 53 inches maximum length twisted-pair, LVD cable with built-in terminator, maximum of five drives with a minimum drive spacing of 5.25 inches
- The SCSI controller requires a unique SCSI ID (0–7 or 8–15) for each SCSI device installed. The controller identifies a SCSI device by its SCSI ID number rather than by its location. Moving a SCSI device from one position to another on the SCSI chain does not affect communication between the controller and the device. The reserved and available SCSI ID numbers for SCSI devices are:
  - 0—reserved for the primary hard drive
  - 7—reserved for the controller
  - 1 through 6 and 8 through 15—available for all other SCSI devices
- Either a CD-ROM or DVD-ROM is shipped in bay 2.

- Every SCSI chain or circuit must be terminated (closed) at both ends. Some system boards have both ends of the SCSI cable connected to, and terminated by, the system board. Termination can be accomplished through one of the following methods:
  - ❏ Using a cable with a built-in terminator. This cable was shipped with your workstation.
  - ❏ Using a cable with a terminating resistor plug in the last connector.
  - ❏ Connecting a SCSI device with its termination enabled into the last connector.
  - ❏ Connecting an external SCSI device with its termination enabled to the external SCSI connector on the rear panel of the computer.
- Turn on all external SCSI devices before turning on the power to the computer. This action enables the SCSI controller to recognize the external devices.
- The system accommodates a combination of internal and external SCSI devices, such as hard drives, tape drives, and CD-ROM drives.
- HP does not recommend mixing different-width SCSI devices on the same SCSI chain or on the same SCSI channel. Mixing devices of different widths on the same chain or channel will always result in the data transfer rate of the slowest device in that chain. It is acceptable to mix Wide-Ultra2, Ultra 160, and Ultra 320 devices on a single channel. Do not put Narrow devices on a channel with any device type other than another Narrow device.

For additional information about optional SCSI devices, refer to the documentation included with the device or contact your HP authorized dealer, reseller, or service provider.

CAUTION: Do not route cables near the air intake to the power supply. Cables routed in this manner can block airflow to the power supply, causing it to overheat.

Guidelines for Installing SCSI Devices

If you mix Ultra ATA and SCSI hard drives in the same system, the Ultra ATA drive will be the boot drive unless the boot order is changed in the F10 Setup.

When replacing a hard drive, the replacement drive should be of the same type as the drive being removed. If you are replacing an Ultra ATA hard drive with a SCSI hard drive, you will need a multimode LVD SCSI cable option kit.

If only one SCSI hard drive is used, it should be installed in bay 4.

Before installing a SCSI device:

- Verify the SCSI ID of the drive and, if necessary, set the SCSI ID to a unique number. See "Guidelines for Using SCSI Devices" in this appendix or refer to the documentation included with the device.
- Determine if the device requires that termination be enabled or disabled. Set the termination if necessary. See "Using a SCSI Cable" in this appendix or refer to the documentation included with the device.

SCSI Controllers

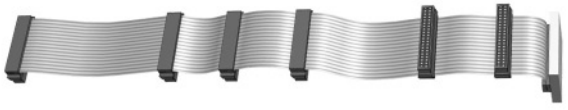
Your workstation ships with an integrated single channel Ultra 160 SCSI controller with an internal connector on the system board.

SCSI Cables

The front drive bays are available for installing or connecting mass storage SCSI devices.

Using a SCSI Cable

Selected models of the HP workstation xw6000 ship with a multimode SCSI cable that supports Low Voltage Differential (LVD) or single-ended devices. The cable accommodates up to three SCSI devices in the front drive bay area (UATA models do not have the SCSI cable).



Five-device SCSI cable with terminator

The cable that shipped with your workstation may look different than the one illustrated (a five-device cable).

If you are installing a narrow SCSI device, you will need to attach a 68-pin to a 50-pin SCSI adapter.

For additional information about installing optional SCSI devices, refer to the documentation included with the device option kit, or contact your HP authorized dealer, reseller, or service provider.

Using SCSI*Select* with SCSI Devices

The SCSI host adapter includes the SCSI*Select* utility to configure the host adapter and to run SCSI disk utilities. To run the SCSI*Select* utility:

- In Post Messages Enabled mode: Press **Ctrl + A** when the Press <Ctrl><A> for SCSI*Select* Utility message displays during POST.
- In Post Messages Disabled mode: When the HP logo screen displays, press any key to exit the logo screen. Immediately after exiting the logo screen, press **Ctrl + A** to access the SCSI*Select* utility.

A menu displays with the following options:

- Configure/View Host Adapter Settings
  - SCSI Bus Interface Definitions
    - Host Adapter SCSI ID
    - SCSI Parity Checking
    - Host Adapter SCSI Termination
  - Additional Options
    - Boot Device Options
    - SCSI Device Configuration
    - Advanced Configuration Options
- SCSI Disk Utilities
  - Lists all SCSI devices and SCSI ID numbers

For additional information about configuring POST message display status, refer to the *Computer Setup Guide* on the *Documentation Library* CD.

C

Battery Replacement

Replacing the Battery

The battery that comes with your computer provides power to the real-time clock and has a lifetime of about three to five years. When replacing the battery, use an equivalent 3-volt lithium coin cell battery. A replacement battery may be purchased at your local retailer or from the HP Web site.

The spare part number for a standard coin cell battery is 153099-001, which corresponds to a CR2032 battery or equivalent.

WARNING: Your computer contains an internal lithium manganese dioxide, vanadium pentoxide, or alkaline battery or battery pack. There is a risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 140° F (60° C).
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.
- Replace the battery only with the HP spare designated for this product.

CAUTION: Static electricity can damage the electronic components of the workstation or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, your authorized partners, or their agents.

To replace the battery:

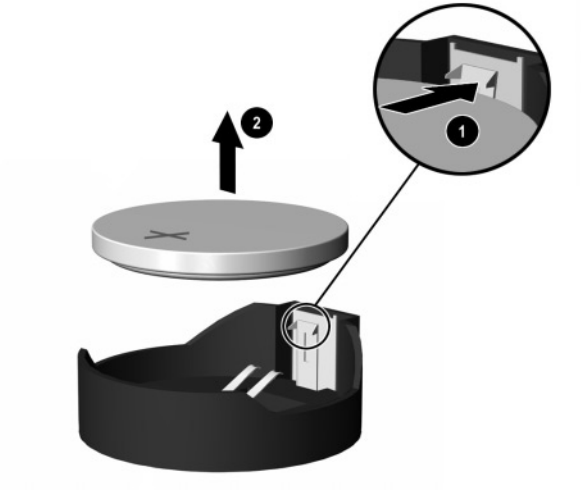
1. Shut down the operating system properly, turn off the computer and any external devices, disconnect the power cord from the electrical outlet, and remove the computer cover or access panel.

It may be necessary to remove an expansion card to gain access to the battery.

2. Locate the battery ❶ and battery holder ❷ on the system board, as shown in the following illustration.

Battery and battery holder

3. Press on the release tab ❶ and then lift the battery out.



Removing the coin cell battery

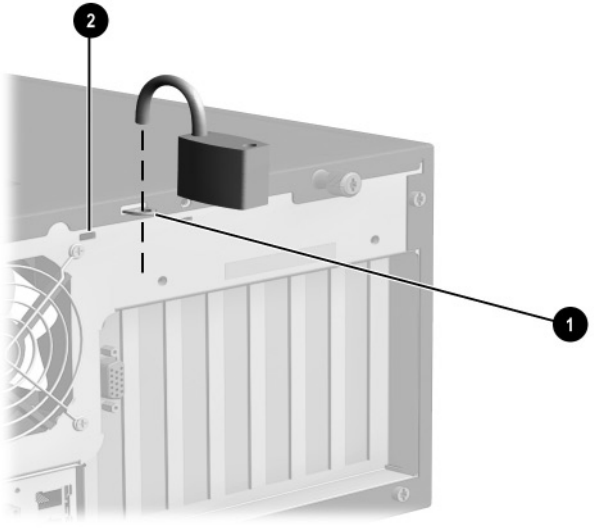
4. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.
5. Replace any expansion boards you have removed.
6. Replace the computer cover or access panel.
7. Plug in and turn on the computer.
8. Reset the date and time, your passwords, and any special system setups, using Computer Setup. Refer to the *Computer Setup Guide* on the *Documentation Library* CD for additional information.

D

Security Lock Provisions

Securing the Workstation

Your workstation is designed to accept a lock ❶ (not provided) to control access to the inside components. Your workstation is also designed with a cable lock slot ❷. An optional cable lock is available to help secure the workstation to a fixed object using this cable lock slot.



Securing the workstation

E

Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

Several methods for grounding are available. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/-10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding or if you need for more information about static electricity, contact your HP authorized dealer, reseller, or service provider.

F

Routine Computer Care and Shipping Preparation

Routine Computer Care

Follow these suggestions to take care of your computer and monitor:

- Operate the computer on a sturdy, level surface. Leave a 3-inch (7.6-cm) clearance at the back of the system unit and above the monitor to permit the required airflow.
- Never operate the computer with the cover or side panel removed.
- Never restrict the airflow into the computer by blocking the front vents or air intake. Do not place the keyboard, with the keyboard feet down, directly against the front of a unit that is in a desktop configuration because this also restricts airflow.
- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold. For information about the recommended temperature and humidity ranges for your computer, see to Appendix A, “Specifications,” in this guide.
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Turn off the computer properly before you do either of the following:
  - ❏ Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
  - ❏ Occasionally clean the air vents on the front and back of the computer. Lint and other foreign matter can block the vents and limit the airflow.

CD-ROM Drive Precautions

Be sure to observe the following guidelines while operating or cleaning your CD-ROM drive.

Operation

- Do not move the drive during operation. This may cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature, because condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

Cleaning

- Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.
- Avoid using any type of solvent.

Safety

If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized HP service provider.

Shipping Preparation

Follow these suggestions when preparing to ship your computer:

1. Back up the hard drive files onto PD discs, tape cartridges, or diskettes. Be sure that the backup medium is not exposed to electrical or magnetic impulses while stored or in transit.

The hard drive locks automatically when the system power is turned off.

2. Remove and store any program diskettes that are located in the diskette drives.
3. Insert a blank diskette into the diskette drive to protect the drive while in transit. Do not use a diskette on which you have stored or plan to store data.
4. Turn off the computer and external devices.
5. Disconnect the power cord from the electrical outlet and then from the computer.
6. Disconnect the system components and external devices from their power sources and then from the computer.

Ensure that all boards are seated properly and secured in the board sockets before shipping the computer.

7. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

For environmental nonoperating ranges, see Appendix A, “Specifications,” in this guide.

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